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GEOPHYSICAL ABSTRACTS

NO. XVIII

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BY

Frederick W. Lee

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DEPARTMENT OF COMMERCE -- BUREAU OF MINES

GEOPHYSICAL ABSTRACTS[1]

No. 18

Compiled by Frederick W. Lee[2]

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1. GRAVITATIONAL METHODS

TORSION-BALANCE SURVEY OF ESPERSON SALT DOME, LIBERTY COUNTY, TEX.

By Donald C. Barton

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1129-1145.

The Esperson salt dome was discovered in a torsion balance survey made by the Union Exploration Co. late in 1928. The discovery well of the oil field on the dome was completed in the summer of 1929. The torsion balance survey showed the presence of (1) a large minimum indicating the Esperson dome, (2) a similar minimum due to the South Liberty-Dayton salt dome, and (3) two maxima, one of them due to the interference effect of the Esperson and South Liberty-Dayton minima, and the other to the interference effect of the Esperson minimum and the minima of the Moss Bluff, Lost Lake, and Barbers Hill salt domes. The approximate form and position of the Esperson dome on a northeast-southwest profile were calculated by the writer's chart method. The calculations seem to indicate that the respective salt cores of the Esperson and South Liberty-Dayton domes must extend to a depth of 15,000 ± feet and be broader at the base than at the top. The center of the Esperson minimum is shifted about one-half mile south-southeastward from the center of uplift as approximately defined by drilling. Shifts of the center of the minimum away from the center of uplift may be due to (1) asymmetry of the dome, (2) regional gradient, (3) a spine of salt rising into the neutral zone, (4) local anomalies.

A certain degree of indefiniteness is inherent in the torsion balance indication of the exact position and depth of a deep salt dome, but additional uncertainty is produced by some methods of interpretation. The torsion balance data offer no criteria for determination of the presence or absence of deformation of the super-salt beds. Four types of gravity maxima may be present in the Gulf Coast region: (1) Salt dome maxima produced by shallow salt domes, (2) interdome maxima produced by the interference effect of the salt-dome minima, (3) structural maxima, and (4) sedimentary maxima.--Author's abstract.

ADJUSTMENT OF GRADIENT OF TORSION BALANCE AND APPLICATION OF UNDULATION METHOD TO GRAVITY MEASUREMENTS

By J. G. Koenigsberger

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1221-1224.

A very good control and adjustment of surveys made with a magnetometer or with a torsion balance based on the least-square method and especially fitted for scalars or for vectors of only one direction has been given by Donald C. Barton.

For the gradient vector observed with the torsion balance, the author proposes a method not very accurate but easy, by which two problems can be solved, if the inhomogeneities of terrain and the errors of the instrument vary irregularly from station to station, disturbing the results. The two problems are:

(1) To find the isogams, and (2) to find the regional trend of the gradient so that it can be subtracted from the local values.

The method is briefly described.--W.Ayvazoglou.

SCHWEREMESSUNGEN UND GEBIRGSBAU IM RIESEN-GEBIRGE

(GRAVITY MEASUREMENTS AND OROGRAPHY OF THE RIESEN-GEBIRGE)

By Robert Swinner

Jahrbuch der Preussischen Geologischen Landesanstalt zu Berlin,
vol. 49, part 1, 1928, pp. 270-278.

The author gives a description of the structure of the Riesen-Gebirge based on the numerous geological investigations. In conclusion he says that to complete the geological work, geophysical methods of investigation of the area should be applied, as those points which could not be reached by geologic survey may offer results by which not only the knowledge of special structures could be increased but also a better understanding of the process of intrusion of deep rocks could be obtained.--W. Ayvazoglou.

2. MAGNETIC METHODS

DIE SÄKULARVARIATION IN DER RHEINPFALZ IN DEN JAHREN 1850 BIS 1928

(SECULAR VARIATION IN THE RHINE PALATINATE IN THE YEARS FROM 1850 TO 1928)

By Fr. Burmeister

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 186-190.

The results of new magnetic measurements carried out in the Palatinate are compared with those obtained by J. von Lamont in 1852 and G. von Neumayer in 1855-56. The new measurements were made by the author of this article in 1927-28. Sixty stations, about 10 kilometers distant one from another, were covered. Stations selected by former observers were used, if possible. Working out of the new survey of the Palatinate is almost completed; its results concerning the changes of the magnetic elements (declination, horizontal intensity, inclination) are shown in a table.

An error in Neumayer's measurements caused by neglect by him of the meridian convergence, which for this place amounts to about 32 feet, was discovered.--W. Ayvazoglou.

GRÖSSENVERHÄLTNIS VON REMANENTEM ZU INDUZIERTEM MAGNETISMUS IN GESTEINEN; GRÖSSE UND RICHTUNG DES REMANENTEN MAGNETISMUS

(PROPORTION IN VALUES OF THE REMANENT MAGNETISM TO THE INDUCED MAGNETISM IN ROCKS; VALUE AND DIRECTION OF THE REMANENT MAGNETISM)

By J. Koenigsberger

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 190-207.

The rocks, partly in oriented cubes, were examined according to Brunhes and David, with regard to the direction and amount of the remanent magnetism J per cubic centimeter in values of Γ; they were placed in a highly sensitive astatic system of two pairs of magnets. For the determination of the susceptibility K at about 10 Γ, a cube surface was compared with one of the four magnets according to the image method; measurements on the six surfaces have shown also anisotropy and heterogeneity of K. In tables are given: K, J, J : J_k (J_k = K times of the present total intensity), the heterogeneity "u" and the anisotropy "a" with respect to the three cube normals, both with relation to the mean value of K = 1. For deep rocks J : $J_k < 1$, for eruptive rocks usually from <1 to 10, for lavas about 10, and for a modified quartz porphyry is 75. K decreases only slightly from 15 to 1.5 Γ with the decreasing intensity of field; therefore the K in the earth field calculated in nature from topographic effects corresponds within the error limits of 20 per cent to the K measured in the laboratory. The remanent magnetization often changes its direction very strongly in the same deep-rock masses and eruptive-rock masses, so that the conclusions drawn on the previous magnetic fields are not always reliable.--Author's abstract translated by W. Ayvazoglou.

ÜBER EINE MAGNETISCHE ANOMALIE AM LEBASEE IN OSTPOMMERN

(CONCERNING THE MAGNETIC ANOMALY ON THE LEBA-SEA IN EAST POMERANIA)

By H. Reich

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 207-216.

The author describes the results of his measurements carried out in 1927-28 in East Pomerania on the magnetic anomalies in this region. Ad. Schmidt's local variometers were used. Z-measurements were considered almost exclusively. Amap showing the Z-disturbances is given. According to this map the positive magnetic disturbances are marked by two ranges extending from WSW to ENE; the northern range, which extends along the shore, shows a remarkable relationship with the present course of the coast. A disturbance to the west of Leba was examined closely. The disturbance was reduced to an eruptive body about 1 kilometer wide and 12 kilometers long situated at a depth of over 600 meters and extending from east to west. A figure showing the Z-isanomalies and another showing the H-isanomalies of the region are given. The H-measurements can not be considered of an equal value to the Z-measurements owing to the fact that the H-variometer did not work as well as the Z-variometer. The mean errors of the Z-measurements reached about ± 10 γ while those of the H-measurements were about ± 20 γ.

A full description of the results of the work will appear later.--W. Ayvazoglou.

DIE ERGEBNISSE DER MAGNETISCHEN MESSUNGEN IN DER OSTSEE IN DEN JAHREN 1924 BIS 1929

(RESULTS OF MAGNETIC MEASUREMENTS IN THE BALTIC SEA DURING THE YEARS FROM 1924 TO 1929)

By A. V. Gernet

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 216-220.

The measurements were started on July 10, 1924, and were continued every summer up to 1929, inclusive. In all, 511 stations were covered. The distribution of the stations was as follows: 117 in Sweden and Finland, 102 in Latvia, 52 in Germany, and 240 in Esthonia.

The author worked out only the measurement carried out in Esthonia. The results of the Swedish-Finnish measurements are published by the Swedish Hydrographic Department and the Finnish Meteorological Central Institution under the title "Magnetic Measurements in the Baltic Sea, South Quarken, first report, and South Quarken and Northern Coast of the Baltic Sea, second report."

The results of Latvia are to be published during this year. The time of the publication of the results of measurements made along the German coast is unknown.

The results of the measurements made in Esthonia are represented by the author in this article by means of three schematic maps, showing the vertical intensity, horizontal intensity, and declination, respectively. All the values are reduced to 1926.5. The maps must be considered to be of a temporary character, as they will be completed by measurements to be made in 1930.

The distribution of the elements of the earth magnetism in the region examined is very irregular. Undisturbed values form an exception. The author notices that the greatest disturbances have their origin on the continent near the shore. Their influence is clearly shown on the water.--W. Ayvazoglou.

ERDMAGNETISCHE MESSUNGEN IN BULGARIEN, MAZEDONIEN, TRAZIEN UND IN DER DOBRUDJA

(EARTHMAGNETIC MEASUREMENTS IN BULGARIA, MACEDONIA, THRACE, AND DOBRUDJA)

By Kyrill Popoff

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 221-224.

The author carried out in 1917-1920 a series of earthmagnetic measurements with Schulze's differential magnetometer No. 18. Astronomic observations were made with the Starke-Kammerer N Theodolite.

The comprehensive tables of the single results were given a reduced form by A. Nippoldt. These tables are added to the article. The values of the magnetic elements represent the mean values of the single values of the measurements.--W. Ayvazoglou.

EINIGE BEMERKUNGEN ÜBER ERDMAGNETISCHE MESSUNGEN WELCHE IN FEODOSSIA AUSGEFÜHRT WURDEN

(SOME REMARKS ON EARTHMAGNETIC MEASUREMENTS CARRIED OUT IN FEODOSIA)

By L. Palazzo

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 225-227.

In this article Palazzo mentions the earthmagnetic determinations made by him in Feodosia in 1914 which, in his opinion, are to be added to Weinberg's "Catalogue of Magnetic Determinations in the U. S. S. R. and in Adjacent Countries from 1556 to 1926," published in Leningrad in 1929.

The purpose of this paper consists not only in filling up the omission of Palazzo's data in the catalogue but mainly of drawing conclusions concerning the magnetic secular variations in Feodosia. The author compares the data of the declination obtained by him with the new measurements made in 1924 and 1925 by Loidis and shows the conformity of the value obtained by the calculation from his formula with that given by Loidis ($D = + 2^\circ 10.6'$ and $D = 2^\circ 11'$, respectively).

The difference of H obtained by calculation and observed by Loidis ($H = 0.22794$ and $H = 0.23005$, respectively) is, of course, greater and is explained by the author by the fact that the force H diminished from 1914 to 1925 probably in a smaller proportion than assumed in his formula.--W. Ayvazoglou.

POSSIBLE CAUSES OF ABNORMAL POLARIZATION OF MAGNETIC FORMATIONS

By C.A. Heiland

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 228-235.

Extensive magnetic local measurements were carried out with Ad. Schmidt's field balance during the last three years in the United States. The region measured comprised more than 1,000,000 square kilometers, the greatest part of which has been investigated in connection with oil geology. The application of the magnetic method in oil geology rests upon the fact that oil anticlines often remain in connection with raisings of the crystalline subsoil. Anticlines develop either by the filling up of old buried ridges and higher pressure of the thicker sediments situated at the flanks, or by folding up of crystalline subsoil together with the covering stratum, or finally by volcanic intrusion into the sediments.

The material obtained by these measurements, as well as by the measurements carried out in connection with mining, contributed much to the enlargement of our experience in the interpretation of the results and has in the first place shown that the pure induction theory can not be applied to the extent sometimes stated in recent publications.

So far the importance of mechanical-geologic forces has been undervalued in general. Experiments proved that a combined application of tractive force and twisting force sometimes caused a reverse magnetization in the normal earth field; variations in the magnitude of the permanent magnetization of magnetite can plausibly be attributed also to the differences in conditions of pressure and temperature during its formation; the reverse magnetization of ore bodies can in many cases be explained by tipping over of deposits after their magnetization; the change of positive and negative anomalies in basalt-flow depends probably also on the congelation of single particles as well as their tipping over during the plastic flow of the cover. Therefore it seems hopeless to derive the direction of the inclination of the earth field in former geological periods from the present direction of magnetization. On the other hand it can be proved that a large number of negative anomalies which were observed over elevated points of paramagnetic formation can also be explained by normal induction; this applies in the following cases: (1) If ore bodies or (2) intrusive veins or magnetite bands along the texture, forming a part of the disturbing bodies of irregular surface, dip flatly to the south; (3) if the magnetite content is submitted to strong local variations probably due to the subterranean cooling inside of the same (mostly volcanic) formation; (4) if the opposite magnetism in a small deposit is induced by an adjacent larger deposit, or finally (5) if, for example, granite was intruded in primitive rocks in magnetically stronger mica-slate and the latter was eroded, so that the thickness of the magnetic formation above the center of intrusion decreased.--Author's abstract translated by W. Ayvazoglou.

DIE GEOLOGISCHE BEDEUTUNG DER SCHAFFUNG EINER ISANOMALIEN KARTE DER MAGNETISCHEN VERTICALINTENSITÄT VON DEUTSCHLAND

(GEOLOGICAL IMPORTANCE OF PREPARING A MAP OF ISANOMALIES OF THE MAGNETIC VERTICAL INTENSITY OF GERMANY)

By Friedr. Schuh

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 235-248.

A series of reasons is given which demonstrate the importance of creating a magnetic map of isanomalies of Germany for the geological investigation. On this occasion the author indicates also that even now the position of the Mittelmeer-Mjösenzone Stilles, between central Germany and Christianiagraben, could be determined with a greater accuracy by means of data obtained from the new magnetic investigations in Holstein and Meklenburg. Several propositions for carrying out these measurements are made.--Author's abstract translated by W. Ayvazoglou.

DIE INNERE GENAUIGKEIT VON INKLINATION MESSUNGEN MIT DEM ERDINDUKTOR

(THE INNER ACCURACY OF MEASUREMENTS OF INCLINATION WITH THE EARTH INDUCTOR)

By O. Venske

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 248-251.

The author discusses the causes of the differences between inclination values which are observed with the earth inductor in two different positions of the circle of altitude. He mentions cases in which the determination of these differences can not be established and examines proceedings by which some of them may be reduced to a great extent or even eliminated entirely.--W. Ayvazoglou.

THEORIE EINER NEUEN GALVANISCHEN WAAGE

(THEORY OF A NEW GALVANIC BALANCE)

By R. Bock

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 251-253.

The applicability of a balance based on the galvanic principle is discussed. Mathematical calculations of the theory are given. According to the author the construction of such a "galvanic balance," which is started already, is entirely justified.--W.Ayvazoglou.

MESSUNGEN IM LUFTSCHIFF

(MEASUREMENTS IN AN AIRSHIP)

By K. Haussmann

Zeitschrift fuer Geophysik, vol. 6, No. 4-7,.1930, pp. 253-255.

In connection with the fundamental principles established by Ad. Schmidt for magnetic measurements in an airship and suitable adjusting of instruments required for this purpose, the author undertook in December, 1928, an experimental trip in the zeppelin from Friedrichshaven to Ulm, passing above the Bodensee.

The results of observations are summed up by Haussmann as follows:

> In case of good weather and suitably constructed instruments the magnetic horizontal and vertical intensities can be measured; in places the measurements of declination of which are not available, suitable data of these magnetic elements can be obtained if the position of the airship can be determined with sufficient accuracy.--W. Ayvazoglou.

UNE MODIFICATION DE L'ENREGISTREUR A MARCHE RAPIDE ET À PETITE CONSOMMATION DE PAPIER DE AD. SCHMIDT POUR L'APPLICATION AUX STATIONS DE L'ANNEE POLAIRE 1932-1933

(A MODIFICATION OF THE REGISTERING ARRANGEMENT WITH A WIDE TIME-SCALE AND ECONOMICAL CONSUMPTION OF PAPER DESIGNED BY AD. SCHMIDT, FOR USE ON STATIONS DURING THE POLAR YEAR 1932-1933)

By D. la Cour

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 255-258.

Owing to the fact that the usual movement of the registering arrangement at a rate of 15 millimeters per hour as exists in most of the magnetic observations is not sufficient for special investigations, Prof. Ad. Schmidt proposed a method by which the registration can be obtained at a greater rate of speed and wider time-scale without either the increase of the consumption of the expensive paper or the work necessary for the development of the curves registered. In order to obtain a model by which quick variations of the three magnetic elements could be registered simultaneously, experiments have been started in the observatory at Copenhagen where such an experimental apparatus is already at work.

The principles of this apparatus are described in this article and a scheme of its arrangement is given. A copy of the first registrations (of June 12) is shown in a figure.--W. Ayvazoglou.

WAS SAGEN UNS DIE PARAMETER EINES MAGNETEN?

(WHAT DO THE PARAMETERS OF A MAGNET TELL US?)

By G. Fanselau

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 258-262.

The representation of the potential of a magnet with the aid of the so-called parameters (series of spherical functions (Kugelfunktionsreihen)) is compared with the representation resulting from the volume magnetization of the magnet; in this way the parameters are brought into connection with the volume magnetization.

By the division of the magnet, investigation of the distribution of the magnetization inside of the magnet becomes possible.--Author's abstract translated by W. Ayvazoglou.

UEBER DIE HERLEITUNG DES POTENTIALS DES TÄGLICHEN ERDMAGNETISCHEN VARIATIONS FELDES

(ON THE CALCULATION OF THE POTENTIAL OF THE DIURNAL EARTHMAGNETIC FIELD OF VARIATION)

By J. Egedal

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 263-265.

As early as 1903 Prof. Ad. Schmidt pointed out that the diurnal variations of the earthmagnetic field are not equal for the stations situated at the same latitude. Therefore in calculating the potential of the earthmagnetic field of variation, not only the geographic but also the geomagnetic coordinates must be taken into consideration.

In this article Egedal discusses, based on an example, the insufficiency of the old method of calculation. He concludes that the necessity of the change in calculation is evident and expresses the hope that the new method will be adopted.--W. Ayvazoglou.

ÜBER DEN VEKTOR DER MAGNETISCHEN STÖRUNG IM APERIODISCHEN VERLAUF

(ON THE VECTOR OF THE MAGNETIC DISTURBANCE IN THE APERIODIC COURSE)

By J. Keränen

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 265-271.

It is well known that the course of the earthmagnetic force, after being freed from periodical deviations, is characterized by the phenomenon of after-disturbance. In the data given by some observatories this course is derived from the mean values at different hours. Ad. Schmidt called this process the "aperiodic disturbance." The vector of the disturbance has at each place a certain direction which lies almost in the plane passing through the axes of the homogeneous magnetization of the earth and of the place. The vector is called, according to its inventor, the Broun's vector. Based on the results obtained from investigations made on the most important properties of the aperiodic vector of disturbance, the author draws the conclusion that the vector of disturbance in the aperiodic course has on the average a horizontal direction equal to that of the usual Broun's vector. This property was very distinctly shown in Sodankylä and Batavia, that is in the polar, as well as the equatorial regions.--Ayvazoglou.

FORSCHUNGSMETHODEN ÜBER DEN ZUSAMMENHANG ZWISCHEN DER SONNENFLECKENTÄTIGKEIT UND DEN ERDMAGNETISCHEN STÖRUNGEN

(METHODS OF INVESTIGATION ON THE CORRELATION BETWEEN THE ACTIVITY OF SUN SPOTS AND EARTHMAGNETIC DISTURBANCES)

By E. Gehlinsch

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 271-284.

In this article the author discusses the most important methods of investigation of the activity of the sun spots and of the variations of the earthmagnetic fields. The following conclusions are drawn:

1. Statistical investigation of the sun spots and of the earthmagnetic fields must be considered to be conclusive; no new facts can be added. By the thorough and ingenious methods, with the aid of which the most notable scientists have worked in this direction, the correlation between the two phenomena has been proved unquestionably.

2. Further investigations must be based on other methods by which more deep penetration into the nature of the sun spots as a physical phenomenon are possible. Here the individual examination of the sun spots as well as a detailed classification of the earthmagnetic disturbances is very important.--Author's abstract translated by W. Ayvazoglou.

BEITRÄGE ZUR ERDMAGNETISCHEN ERFORSCHUNG NORDDEUTSCHLANDS

(CONTRIBUTIONS TO THE EARTHMAGNETIC INVESTIGATION OF NORTH GERMANY)

By E. Kohl

Jahrbuch der Preussischen Geologischen Landesanstalt zu Berlin,
vol. 49, part 1, 1928, pp. 124-137.

The purpose of earthmagnetic measurements carried out in 1926 in the region of Salzgitter-Flachstockheim-Oderwald consisted of examining the magnetic effect of iron ores and salt domes in the vicinity of Salzgitter.

The different measurements were united so that a continuous magnetic profile could be drawn extending over 13 kilometers from the western slope of the Salzgitter mountain chain to the axis of Oderwald.

Schmidt's vertical field balance No. 62964 was used. Forty-nine stations were covered; in most cases three or four measurements were made at every station so that an accuracy within the limits of ± 5 γ (at some stations the accuracy was even ± 0 γ) was reached.

The proceeding of calculations is given in a special numerical table. An attempt (shown in the added outline-map) to construct the isanomalies was made, but a complete picture could not be obtained owing to the insufficient number of stations observed. The results of the investigation are described and compared with two profiles obtained by R. Krahmann from measurements carried out about 500 and 2,000 meters to the south.--W. Ayvazoglou.

MAGNETIC SUSCEPTIBILITY AND MAGNETITE CONTENT OF SANDS AND SHALES

By D. M. Collingwood

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1187-1191.

During a study of the relation between small magnetic anomalies of a local survey and the magnetic susceptibility of the rocks, chiefly sands and shales, comprising the surface outcrop and shallow section, several susceptibility determinations of core samples were made. These determinations were carried out in a field laboratory by means of an apparatus consisting of a laboratory magnetometer and energized solenoids in which the core specimens were placed. The core samples were classified according to lithology, and the percentage of magnetic minerals (chiefly magnetite) in them was determined. The susceptibility determinations were made in a field of approximately 18 gauss. For this and other possible reasons, they are not considered true in an absolute sense for rocks in place in the earth's field. However, the results, which are true in a relative sense, show a definite increase of susceptibility with increase of magnetic mineral content, and indicate that the susceptibility increases from shales through sandy shales and shaly sands to sands.--Author's abstract.

MAGNETICS AND GEOLOGY OF YOAST FIELD, BASTROP COUNTY, TEXAS

By D. M. Collingwood

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1191-1199.

The relation between the geology of the productive "serpentine" mass and the results of a magnetic vertical intensity survey is illustrated by maps, charts, cross section, and profile.

The writer concludes that the high magnetic anomaly is due to an igneous neck in a major fault plane, up which the igneous rock came as a volcanic submarine extrusion at the close of Austin chalk deposition of the Upper Cretaceous. Other geologic evidence indicates that the faulting which occurred during the succeeding Taylor or Navarro deposition was later increased by post-Wilcox (Eocene) faulting, and he suggests that this earlier faulting occurred mostly in association with the igneous activity.

The writer suggests that the search for such serpentine masses in this region constitutes a special field for magnetics with certain limitations. Inasmuch as plugs or vent fillings generally cause the anomaly, lateral bodies with no vent filling remaining in the channels up which the flow came are probably not indicated. However, where a plug effect is indicated by magnetic anomaly, a productive lateral or domal body of serpentine is found in many places.--Author's abstract.

3. SEISMIC METHODS

ON THE PIEZO-ELECTRIC ACCELEROMETER AND ITS APPLICATION TO THE MEASUREMENT OF THE VELOCITY OF THE ELASTIC WAVES PRODUCED BY ARTIFICIAL DISTURBANCES

By Yosio Kato and Saemontaro Nakamura

Proceedings of the Imperial Academy, Tokyo, vol. 6, No. 7, pp. 272-274.

The problem of introduction of a piezo-electric accelerometer into seismometry (Prince B. Galitzin) was discussed. Such a seismometer was designed by O. Wood, who succeeded in recording the change in potential with an oscillographic galvanometer by adopting the resistance capacity amplification, but introduced a transformer in the output circuit to eliminate the large plate current through the galvanometer circuit. What is recorded by this circuit shows, however, the time rate of the change in acceleration instead of the acceleration itself, which is the information desired. The writers improved this point and obtained very large magnification without any increase of difficulties in adjusting the instrument.

A description of such a piezo-electric accelerometer, as well as its application, is given.--W. Ayvazoglou.

ÜBER DEN VERLAUF KÜNSTLICHER ELASTISCHER BODENWELLEN UND DIE BERECHNUNG DER TIEFEN DER UNSTETIGKEITSFLÄCHEN

(ON THE COURSE OF ARTIFICIAL ELASTIC GROUND-WAVES AND THE CALCULATION OF THE DEPTH OF DISCONTINUOUS STRATA)

By O. Barsch

Jahrbuch der Preussischen Geologischen Landesanstalt,
zu Berlin, vol. 49, part 1, 1928, pp. 327-338.

Owing to the uncertainty of the course of the waves on which the calculations are based, there is in the theoretical conclusion a source of error the amount of which depends on the difference in the travel times of the perpendicular wave-rays and those moving with the greatest possible velocities. In this article the author makes calculations on the travel times of the waves moving by these two extreme courses and discusses the possibility of the determination of the resulting source of error by calculation.

The first part of the article deals with the calculation of the travel-times and of the depth of the discontinuous strata, taking into consideration the law of refraction.

Two cases are examined: (1) Strata lying parallel one to another and (2) strata that are not parallel. In the second part the calculation of the depths of the discontinuous strata in case of a perpendicular course of the waves is presented.--W. Ayvazoglou.

INVESTIGATION ON THE DEFORMATION OF THE EARTH'S CRUST IN THE TANGO DISTRICT CONNECTED WITH THE TANGO EARTHQUAKE OF 1927

By Chuji Tsuboi

Bulletin of the Earthquake Research Institute, Tokyo,
vol. 8, part 2, 1930, pp. 153-222.

Contents of the article:

1. Introduction.
2. Data of precise levellings.
3. Study of the results of precise levellings.
4. Comparison of the results of triangulations before and after the earthquakes.
5. Study of the results of triangulations.
6. The relation between the vertical displacements and the divergence.
7. Postseismic displacements of secondary triangulation points.
8. Movements along the Gomura and Yamada faults.
9. Concluding remarks.

Geodetic data concerning the deformation of the earth's crust in the Tango district are discussed.

The cause and the mechanism of the occurrence of earthquakes is examined. The writer points out that there is a close correlation between the geographical distribution of gravitational anomalies and that of the epicenters of earthquakes in Japan. The districts most frequented by earthquakes were found to be those in which the gravitational anomalies are remarkably negative. This suggests that the generation of earthquakes, or rather of the "chaos" of blocking movements, is due to some peculiar circumstances of the physical or chemical state of the portion of the earth's crust in the immediate neighborhood of, or right beneath, the earthquake district, but not to any force working from distant places.--W. Ayvazoglou.

PRELIMINARY REPORT ON THE OBSERVATION OF THE TILTING OF THE EARTH'S CRUST WITH A PAIR OF WATER PIPES

By Ryutaro Takahashi

Bulletin of the Earthquake Research Institute, Tokyo,
vol. 8, part 2, 1930, pp. 143-152.

The instrument used for observations consists essentially of a pair of pipes which are buried horizontally in the ground perpendicular to each other and half filled with water.

In this article the results of observations made for nearly one year and the description of the pipes and the observing chambers are given. Seven figures illustrate the article.--W. Ayvazoglou.

4. ELECTRICAL METHODS

PROBLEMS OF ELECTRICAL PROSPECTING ON THE GROZNEFT FIELDS (IN RUSSIAN)

By A. Shaiderov

Azerbeidjanskoe Neftianoe Khoziaistvo (Azerbeidjan Petroleum Industry),
vol. 10, No. 6, 1930, pp. 58-63.

In speaking of the results of geophysical investigations made on the oil fields in the region of Grozny the author draws the following conclusions: Too-general information, which could be interpreted with great difficulty only, was obtained by the gravimetrical method of prospecting; the seismic method used in this region in the summer of 1929 did not show good possibilities under the existing conditions of work and besides was too slow. The electrical method (Schlumberger) which was used on the Grozny oil fields proved to be sufficiently suitable.

The main question in using geophysical methods of prospecting is that of the amount of the change of parameters of the rocks under investigation. In a lecture delivered by Schlumberger at a meeting of geologists in Moscow in 1929 he gave some information on the amount of the resistance of different rocks. Thus, if the resistances are measured and drawn on a topographic map the configuration of the layer of the resistance sought for may be shown, and such a map of electrical parameters, interpreted geologically, may disclose the character and the structure of the region.

Schlumberger's method of prospecting was used during the winter of 1929-30 on the areas of the Grozneft, and the structure of the anticline has been determined with great accuracy.

Three figures showing the results of the electrical investigation of synclines and anticlines at different places are given. The author concludes the article by giving a brief description of the regions assigned for electrical investigations in the summer of 1930.--W. Ayvazoglou.

ELECTRICAL METHODS FOR SUBSOIL INVESTIGATION

By Sherwin F. Kelly

Proceedings of the Brooklyn Engineers' Club,
vol. 28, part 3, 1930, pp. 22-41.

The present paper concerns principally the use of a direct electric current passed through the ground for the purpose of studying the resistivities of the underlying geological formations. The author does not go deeply into the theory of electrical exploration but discusses some types of problems which the method can solve. He cites cases where the Schlumberger method has been applied, giving examples and illustrations from more complete accounts of the works published elsewhere of which this paper is a summarization. Reference to them are given in the footnotes. The following examples are mentioned:

1. Discovery of the copper ore body of Tilva Roch (Serbia).
2. Study of concealed, tilted strata at Fierville-La-Compagne, in Normandy, France.
3. Location of the Rhine fault near Lobsann (Alsace).
4. Study of the May syncline (Normandy).
5. Exploration for lignite in Landes.
6. Study on the Hettenschlag salt dome in Alsace.
7. Examples showing the electrical predictions and the true depths determined by drilling, in a survey of two dam sites located on the Connecticut River near Littleton, N. H.

Seventeen figures illustrate the article.--W. Ayvazoglou.

ELECTRICAL PROSPECTING FOR OIL STRUCTURE

By Karl Sundberg

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1145-1165.

Electrical prospecting methods were originally developed for the purpose of finding ore. Only recently have electrical methods been applied to oil prospecting. Some investigators assert that oil can be located directly as an insulator by electrical methods, but this is believed to be possible only under extremely favorable conditions, which occur in very few places.

Both potential and electromagnetic methods have recently been applied to structureal studies. Electromagnetic methods, so far as developed at present, are believed to have broader applicability because of greater depth penetration.

The Swedish electrical methods for structural studies are described and the possible applications discussed. The conclusion is that these methods have broad application and that they are particularly suitable for detail work, especially in faulted regions.

Results of electrical surveys in the salt-dome district of Texas and Louisiana, the Balcones fault zone in central Texas, and the West Texas Permian basin are presented and are compared with results of drilling. Most of the electrical pictures agree well with the geological ones.

A party of two or three engineers and 12 or 15 helpers can survey an area of 1 to 6 square kilometers a day. The depth reached generally ranges from 500 to 1,500 feet.--Author's abstract.

GEOELECTRIC INVESTIGATIONS OF NONCONDUCTORS -- FOUR NEW EXAMPLES

By Norbert Gella

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1165-1177.

This article is a theoretical and practical explanation of the application of geoelectric methods in oil fields.

If favorable subsurface conditions exist, valuable results can be obtained by using several methods in combination. Close cooperation with the geologist is of utmost importance.

For examples of practical, successful work in oil fields of Germany, Poland, and Rumania are given.--Author's abstract.

ELECTRICAL SURVEY OF STRUCTURAL CONDITIONS IN SALT FLAT FIELD, CALDWELL COUNTY, TEXAS

By Helmer Hedstrom

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1177-1187.

The writer points out the difficulties in mapping the oil structure of the Balcones fault zone in Texas in the usual way, by a study of surface geology. Core drilling has been used in many places, but has not proved very successful on account of the uncertainty involved in identifying the beds and in correlating them between holes.

A discussion of the application, in this area, of the Sundberg electromagnetic method of mapping structure describes the basic principles and shows the method to be much superior to core drilling in speed and efficiency.

The survey made by the Sundberg method in the Salt Flat, or Bruner, oil field was begun in October, 1928, when only the discovery well was productive and before the trend of the producing fault structure was known. The fault was mapped electrically by one surveying crew in about a month, and the later development of the field has proved the results correct, as shown by the map.

A comparison of these electrical results with the data obtained from later drilling gave excellent agreement, as shown by five different profiles across the field.--Author's abstract.

ELECTRIC AND ELECTROMAGNETIC PROSPECTING FOR OIL

By W. P. Jenny

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1199-1215.

General geologic problems of electric oil prospecting are discussed and the main theories for electric and electromagnetic oil prospecting developed.

According to practical experience, the average depth reached by electric surveys is less than 600 feet.

Interpretations based on simple assumptions ordinarily approach the actual geologic conditions more closely than interpretations based on complicated theories.--Author's abstract.

5. RADIOACTIVE METHODS

THE GEIGER TUBE ELECTRON COUNTER

By L. F. Curtiss

Bureau of Standards Journal of Research
vol. 5, No. 1, 1930, pp. 115-125.

Experiments are discussed which show that the sensitive surface of the Geiger tube counter is not on the wire electrode, but on the inner surface of the tube. This result explains the previously observed result (see Geophys. Abs. No. 15) that the operation of the counter is only slightly affected by the condition of the surface of the wire electrode. An explanation of the operation of the counter is offered which takes account of this additional information.

Contents: (1) Introduction; (2) Recent experiments on the location of the sensitive surface; (3) Discussion of operation of counter.--Author's abstract.

6. GEOTHERMAL METHODS

DER TEMPERATURVERLAUF IM SANDBODEN

(THE COURSE OF THE TEMPERATURE IN SANDY SOIL)

By R. Süring

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 285-291

In this article the author gives some information on the diurnal course of the temperature in the upper strata, as well as on the yearly temperature distribution at greater depths. The question is discussed under the following headings: (1) The diurnal temperature exchange between the surface of the earth and the depth of 1 meter; (2) The yearly course of the temperature down to 12 meters of depth; (3) Temperature variations at greater depths.

In his résumé the author says:

> In representing the diurnal course of the temperature in the upper strata of an almost homogeneous sandy soil it is proved that the distribution of the heat is not as uniform as could be expected. In connection with this the author points out that the vertical temperature gradient in the soil shows several changes during the greatest part of the year; these changes must probably be attributed partly to the distribution of the underground waters and partly to the after-effects of greater air anomalies occurring in the deep strata.--W. Ayvazoglou.

GEOTHERMAL PROSPECTING (IN RUSSIAN)

By V. I. Belov

Wissenschaftliche Abhandlungen des Donetz-Berginstituts Namens Artem in Stalin, vol. 4, 1929, pp.95-102.

The author notices the usefulness of geothermal prospecting for the geologist and derives mathematical formulas for the calculation of geothermal gradients, law for the change of the temperature based on different factors and various indirect influences.

He concludes that the essential point of the geothermal prospecting consists of measuring the temperatures and the determination of distances from factors influencing the change of the temperatures. The factors by which the temperature anomalies are caused are enumerated.--W. Ayvazoglou.

7. UNCLASSIFIED METHODS

REVIEW OF GEOPHYSICAL PROSPECTING FOR PETROLEUM, 1929

By Donald C. Barton

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 9, 1930, pp. 1105-1129.

The campaign of geophysical exploration continued without abatement in the Gulf Coast region during 1929. Thirty-five prospective salt domes were discovered during the year. Six commercial oil fields were discovered in the Gulf Coast region, and one, Van, in northeast Texas, on geophysically discovered salt domes or structures. The torsion balance was restored to favor for reconnaissance for (deep) salt domes, and by the end of the year about 80 torsion balances were working in the Gulf Coast region. In the United States, outside of the Gulf Coast salt-dome area, the seismic, torsion-balance methods, to a less extent the magnetometer, and to a very much less extent the electric method, continued in moderate or sporadic use in Texas, Louisiana, Mississippi, Arkansas, Oklahoma, Kansas, Colorado, New Mexico, California, and Michigan.

In foreign countries considerable use of geophysical methods continued in Mexico, Venezuela, and Roumania, and there was some use of them in many other countries.--Author's abstract.

GEOPHYSICAL PROSPECTING FOR MINERALS

By Arnaldo Zabelli

Queensland Government Mining Journal,
vol. 31, No. 361, pp. 256-258.

In this article (originally published in Mineraria Italiana) the author discusses what possibilities might arise if, on the basis of the numerous data which the United States Bureau of Mines collects and publishes on the geophysical explorations effected in the United States and abroad, the Bureau of Mines could accomplish the following tasks: (1) Scientifically to establish if, and to what extent, there really exist appreciable links (such, that is, as can be measured) between the physical properties (electrical, electromagnetic, electrochemical, seismic, radioactive, thermic) of the useful minerals in the subsoil and measuring instruments placed above the soil. (2) To define the real industrial range of the employment of the various geophysical methods and thus to fix their proper place in mining economy. (3) To deduce from the two affirmative presuppositions the best line to be followed in further speculation, both theoretical and experimental, in order to approach ever more rapidly toward the realization foreseen by Leonardo da Vinci when he predicted that the "hidden treasures and gems in the womb of the earth shall all be manifest." (4) Finally, to study the best means of eliminating that outcrop of improvisation which, vaunting marvelous specialties, and finding a particularly fruitful field of action, speculates on the confidence engendered by success, and thus does serious harm to the mining industry, and delays still more the already slow progress of geophysics.

Examples are given supporting the necessity of the realization of Zabelli's propositions.--W. Ayvazoglou.

CHOICE OF GEOPHYSICAL METHODS

By Frank Rieber

Mining and Metallurgy, vol. 11, No. 282, 1930, pp. 301-305.

In this article the author discusses the selection of a geophysical method applicable to prospecting for oil or for other minerals. Rieber examines especially the problem of checking the rising cost of the discovery of new fields (particularly on the Pacific coast) by the proper employment of geophysical methods.

Different methods are examined and the importance of the interpretation of the results for the choice of the most suitable one is mentioned. The author says:

> In the development and adaptation of geophysical methods, there are several things to be considered by everyone concerned. First, a criticism of the geophysicist: The natural tendency is to take every possible measure to obtain work. There is a great temptation to claim too much for a method, to overstate what can be hoped from it, particularly if everyone else is doing the same thing. Nine figures illustrate the article.--W. Ayvazoglou.

A BRIEF REVIEW OF ARTICLES APPEARING IN VOL. 1, NO. 8-9, OF THE "BOLETIN DE LA ASOCIATION GEOFISICA DE MEXICO"

Boletin de la Asociation Geofisica de Mexico,
vol. 1, No. 8-9, 1930, pp. 127-153.

1. Radioactivity a topic of to-day's geophysics. This is the first part of a lecture delivered by Prof. Juan Korzujin in the Geophysical Association of Mexico in February, 1930 (an abstract will be published after the conclusion of the article).

2. Method for measuring the susceptibility of rocks, by J. G. Koenigsberger (see Geophys. Abs. No. 9, p. 18).

3. Physical principles of the gravimetric method of prospecting, by P. Nikiforov. Continuation of the Russian article, translated into Spanish by Prof. Juan Korzujin (see Geophys. Abs. No. 16, p. 16).

4. Geophysical methods of prospecting, by Georges A. Boutry. Continuation of the French article translated into Spanish by L. Urguijo, Eng. (see Geophys. Abs. No. 16, p. 16).--W. Ayvazoglou.

ERFAHRUNGEN MIT GEOPHYSIKALISCHEN METHODEN IN SÜDAFRIKA

(EXPERIENCE WITH GEOPHYSICAL METHODS OF PROSPECTING IN SOUTH AFRICA)

By H. Reich

Metall und Erz., vol. 27, No. 11, 1930, pp. 287-291.

The author reports on the results of geophysical prospecting work in South Africa, especially in the copper districts, and shows how, by means of rough measurements of electric resistances (under natural conditions) and magnetic susceptibilities (on samples), the possibility of application of geophysical methods in real cases can be estimated. The author is of the opinion that the failures of electrical prospecting conducted so far in the copper deposit areas in "Klein-Namaqua-land near Ookiep and Nobabeep" can be explained by climatic conditions of the region. The dry climate causes an extreme dryness of the upper strata of the soil and a saturation of subterranean waters with salts. Fissures and layers saturated with these waters may easily make the obtained indications obscure. In addition to this the electrical resistances of the local porous rocks in case of absolute dryness and even small humidity are very different. The structure of the rocks is not favorable for electrical prospecting either.

The author finds that the magnetic method can be used here with advantage for limiting the ore areas; after this the electrical prospecting may be used with greater success as the interpretation of the data becomes easier.

Very successful were the results of the electrical methods of prospecting in the Si district in North Rhodesia at the border of the Belgian Congo.

Investigations made by the author show that the electrical methods can not be used for prospecting sedimentary ores of Katanga types (eingesprengte "oxydierte" Erze) but good results may be expected for prospecting sulphide bodies in the Broken Hill (North Rhodesia) dolomite deposits. Very promising is the prospecting for titanium-magnetite deposits near Pretoria and the chromite deposits of Great Dyke.

Selukwe chromites are characterized by small magnetic susceptibility and are bad electric conductors.

Concerning geophysical prospecting for gold the author is of the opinion that under the existing conditions (conglomerates) the electrical method can not be used; the application of this method for gold veins of the South Rhodesia type with large concentration of sulphide minerals is possible but here also the picture may be obscured by the proximity of graphitic slates and wet rocks so that practically the electrical prospecting will become difficult.

The determination of the famous "pipes" with which the primary diamond deposits are connected is, according to the author, possible by using the electrical as well as the magnetic method. Crystalline slates of the deep underground and the superficial sedimentary covers are not as good conductors as the blue iron earth (Blaugrund) and are of smaller susceptibility. Practically the geophysical determination of "pipes" does not promise much success because owing to comparatively small difference in physical properties (requiring very accurate measurements and large surfaces of these "pipes") and complexity of geological structure, the results of the measurements may be obscured. The author is of the opinion that the idea of magnetic prospecting for diamond placers, discussed recently in the South African mining literature, can absolutely not be realized. Prospecting for gold placers is possible in case they are connected with large accumulations of magnetite (U. S. A., Heiland).

The method can not be applied for diamond placers of South Africa owing to the fact that their content of magnetite is absolutely insufficient for producing the necessary effect. Besides the magnetite content can not serve as an indication of a diamond deposit.

The author draws the conclusion that the general aspect for application of geophysical methods of prospecting in South Africa in the regions of the ancient "Continentalsockel" is not very promising. On the other hand, in the regions covered with new formations the application of the geophysical methods in connection with drilling is the sole means for the study and penetration into the deep strata.--V. Gorsky.

ÜBER EINIGE METEOROLOGISCHE BEGRIFFE

(CONCERNING SOME METEOROLOGICAL CONCEPTIONS)

By Otto Tetens

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 297-310.

Different meteorologic moisture-conceptions are classified. Poisson's law is proved to be valid at adiabatic changes of state for the whole period of dryness. Owing to the fact that there are only a few aerological places of investigation and their work is uncertain it is important that the paths of the state be inserted between two corresponding places of adjacent ascents.

Formulas and drawings, taking into consideration the entropy, content of water vapor, and density of the air, are given.--Author's abstract translated by W. Ayvazoglou.

ÜBER DIE FEINSTRUKTUR DES TEMPERATURGRADIENTEN LÄNGS BERGHÄNGEN

(ON THE ACCURATE MEASUREMENT OF THE TEMPERATURE GRADIENT ALONG MOUNTAIN SLOPES)

By A. Wagner

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 310-318.

Wagner describes the investigations carried out in connection with meteorological peculiarities in mountainous regions. Five meteorological stations provided with recording instruments were established at different altitudes near Innsbruck. The records obtained during the period of over one year served as the basis for the investigation.

In this article the author describes briefly several measurement trips, the purpose of which was to establish the temperature gradient along the mountain slopes and its dependence on the time of the day, season, and weather conditions. The author succeeded in assembling an instrument by means of which, owing to the possibility of its almost instantaneous adjustment, a reliable reading could be obtained from the moving cabin.

A description of the electrical resistance thermometer provided with ventilation used during the trips and a schematic design of it are given. Figures are added showing (1) the temperature distribution along the slope of Innsbruck-Hafelekar on April 2, 1930, (2) the longitudinal profile Innsbruck-Hafelekar and (3) the temperature distribution on November 23, 1929.

Characteristic details of temperature variations and temperature disturbances along the mountain slope are discussed.

Two experimental ascents in airplanes have proved the full fitness of this electrical measurement method; the readings from the needle galvanometer could be made with great accuracy.--W. Ayvazoglou.

DAS UNPERIODISCHE ELEMENT IM TROPENKLIMA

(THE APERIODIC ELEMENT IN THE TROPICAL CLIMATE)

By K. Knoch

Zeitschrift fuer Geophysik, vol. 6, No. 4-7, 1930, pp. 318-329.

In addition to the very irregular weather conditions in tropical climates there are also characteristic atmospherical changes which are called the "aperiodic element in the tropical climate." These changes have not been given a correct estimation so far. They may appear in the form of variations in yearly distribution of precipitations, of heavy showers in areas usually lacking in rain, of aperiodic temperature changes, cold winds, pressure variations, and of storms. Corresponding examples are mentioned. Without taking into consideration the changes in the yearly distribution of precipitation, which are brought into connection with the displacements of the great wind zone of the earth, in most other cases the reason might consist of the movement of air-masses from higher latitudes to the tropics. Therefore the conclusion is drawn that the aperiodic element in a tropical climate may be explained by the interdependence of the tropic zone, and the climate zones of higher latitudes.--Author's abstract translated by W. Ayvazoglou.

NECESSITY OF URGING PROSPECTING FOR NEW OIL DEPOSITS (IN RUSSIAN)

By B. Numerov

Za Neftianuiu Piatiletka (For the five-year program in the oil industry), vol. 1, No. 6-7, 1930, pp. 6-7.

In this article Numerov expresses his opinion on the geophysical methods of prospecting, especially magnetic and gravimetrical, based on information obtained by him during his recent visit to the United States. The importance of general magnetic and gravimetric surveys of large areas is noticed. An aerial survey which can be substituted for the usual topographic survey is recommended owing to its low cost and quick work (from 50 cents to $1 per square kilometer; 1,000 square kilometers can be surveyed during one day).

He says: "Prospection of oil-bearing deposits in the U. S. S. R. can be carried out more quickly if the simple method of aerial survey is used."--W. Ayvazoglou.

THE SWAN WELL

Michigan Well Driller, January, 1930, pp. 3, 5, and 9.

In the Michigan Well Driller for January, 1930, pp. 3, 5, and 9, there is an interesting history of the Swan well, including the results of a series of measurements to determine the depths at which the main flows of water were entering. The best result was obtained by using a current meter lowered by heavy electric cable, and the variation of velocities of the current meter showed very distinctly the points where flows entered.--Alfred C. Lane.

9. NEW BOOKS

Comptes Rendus du II. Congres International de Forages (Second International Drilling Congress, Paris, September 16-23, 1929). These proceeding form a work of 718 pages divided into several chapters: (1) Organization of the congress, a general list of delegates, program of the congress, entertainments, and excursions; (2) technical papers. The papers, 67 in number, are supplemented by discussions. They include 19 reports on geology and stratigraphy; 10 reports on geophysical methods of prospecting; 18 on drilling technique and related subjects; 5 on drilling application; 13 on economics and statistics of drilling and recording of results; and 2 on drilling laws. Orders taken by the Secretary of the Congress, 85 Boulevard de Montparnasse, Paris (6e). 2 volumes, 718 pp. Price, 100 francs.

Krejci, Karl. Grundfragen der Oelgeologie (Basic Questions of Oil Geology). Verlag von Ferdinand Enke, Stuttgart, 1930. 182 pp., 7 figs., price 20 marks. Eleven chapters (chapter 9 deals with geothermic problems).

Marr, J. E. Deposition of the sedimentary rocks. Cambridge University Press, 1929; The MacMillan Co., New York, 5 by 7-1/2 inches, 245 pp. Price, $2.40 (7 s. 6d.).

Webel, A. A German-English Technical and Scientific Dictionary. Routledge and Sons, Ltd., Broadway House, Carter Lane, E. C., London, Price 36 s. net.

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